

Remarks

Claims 1, 4, 7, 14, 24-27, 31 and 38 have been amended, and claims 1-7 and 14-40 remain in the application. Re-examination and reconsideration of the application are respectfully requested. Applicants appreciate the indication of allowable subject matter.

Claims 1-6 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite for reasons stated in the Office Action. Claims 1 and 4 have been amended to overcome the rejection, and Applicants submit that the rejection of claims 1-6 under 35 U.S.C. §112, second paragraph, should be withdrawn.

Claims 1-3, 5, 14, 15, 26, 28-31, 38-40 are rejected under 35 U.S.C. §102(b) as being anticipated by Bievenue et al., U.S. Patent No. 6,170,760, which relates to a compact spray valve that produces a small diameter spray pattern using an extended atomizing air cap for applying a coating onto a substrate such as a printed circuit board.

Bievenue et al. does not describe or suggest an applicator as recited in amended independent claim 1 and shown in Fig. 2A. First, claim 1 requires a distal end 87 of a nozzle 84 extending beyond a distal end 115 of a cap 94. The structure recited in claim 1 exposes the nozzle distal end 87 for easy visual inspection and manual or automated cleaning. In contrast, referring to Fig. 1 of Bievenue et al., the valve seat 56 at the distal end of the seat body 57 is wholly contained within the air cap 78. Second, the structure of claim 1 requires a needle guide 78 disposed near a distal end of a body 42, 50, that is, an end of the body further away from a point of attachment. As described at col. 3, lines 26-28 and shown in Fig. 1 of Bievenue et al., a needle 50 is guided and centered by a packing nut 74 and packing material 76 disposed at a proximal end of a body 44, that is, an end nearer a point of attachment.

Amended independent claims 14, 26 and 31 all contain a recitation of at least one of the alignment guides 105, 107 shown in Fig. 3, which are used to maintain an alignment between the fluid extension 70 and the air cap 94. Referring to paragraph 37, lines 7-10, an upper alignment guide 105 on air cap 94 has splines 106 that contact outer surface 108 of extension 70 to maintain respective upper ends of those two parts concentric, that is, in coaxial alignment. Similarly, referring to paragraph 38, lines 1-5,

a lower alignment guide 107 on extension 70 has splines 112 that bear against wall 114 of cap 94 to hold the lower ends of those parts in coaxial alignment. Improved coaxial alignment of the air cap 94 with the fluid extension 70 provides a more consistent and uniform flow of assist air therebetween.

In contrast, it is Applicants' understanding that in Bievenue et al., as shown in Fig. 1, a seat extension 120 is aligned with a body 44 via a distal end bore; and an air cap is aligned with the body 44 via a threaded retaining ring 84. It should be noted that in Fig. 4 of Bievenue et al., an air cap 78 has interior fluted surfaces 210 that, with an exterior surface 208 of a seat extension 120 provide air conduits 202. Applicants submit that innermost portions of the fluted surfaces do not contact the outer surface 208 of the seat extension 120. A clearance between the air cap 78 and seat extension 120 is clearly shown in Fig. 4; and therefore, Applicants submit that Bievenue et al. does not in any way describe or suggest any alignment function of the interior fluted surfaces 210 for aligning the air cap 78 with the seat extension 120. Thus, Applicants submit that Bievenue et al. does not show or describe upper and lower alignment guides recited in claim 14, nor an alignment guide on an inner surface of a cap as recited in claim 26, nor an alignment guide disposed on a distal end of a body extension as recited in claim 31.

With respect to amended independent claim 38, Bievenue et al. does not describe, show or suggest an applicator as shown in Fig. 2A having a nozzle 84 with a taper 117 at a distal end 87 and a cap 94 having tapered inner and outer surfaces 113, 118 forming a conical cross-sectional profile substantially conforming with the taper 117 of the nozzle. In contrast, the air cap 78 of Bievenue et al. has a tapered inner surface but a square outer surface that limits access of the cap 94 into tighter locations. The tapered cap of claim 38 has several advantages. First, the cap taper facilitates greater access to tight and hard to reach locations. In addition, during the deposition process, assist air currents can bounce off of the substrate and be reflected back toward the nozzle; however, the thin and tapered design deflects those reflected assist air currents away from the nozzle distal end and air cap distal end. The thin and tapered design also minimizes an accumulation of atomized droplets of conformal

coating material on the nozzle that bounce back from the substrate toward the nozzle. Further, the air cap taper places the air cap orifice further downstream than other structure of the air cap and thus, facilitates automated cleaning of the air cap distal end and orifice.

In view of the above, Applicants submit that claims 1-3, 5, 14, 15, 26, 28-31, 38-40 are patentable and not anticipated under 35 U.S.C. §102(b) by Bievenue et al.

Claims 1-7 and 22 are rejected under 35 U.S.C. §103(a) as being unpatentable over Bievenue et al. in view of Byerly et al., which relates to a liquid dispensing valve having needle guides 18 and 20. In order to establish a prima facie case of obviousness, it is necessary that the Office Action present evidence, preferably in the form of some teaching, suggestions, incentives or inference in the applied prior art or, in the form of generally available knowledge, that one having ordinary skill in the art would have been led to arrive at the claimed invention.

A prima facie case of obviousness is not made because Bievenue et al. and Byerly et al. when taken either alone or in combination do not disclose or suggest the inventions of claims 1-7 and 22. As discussed above with respect to claim 1, Bievenue et al. and Byerly et al., when taken alone or in combination, do not describe, show or suggest an applicator that first, has a distal end of a nozzle extending beyond a distal end of a cap forming a fluid path with the nozzle, or second, a needle guide disposed near a distal end of a fluid extension. Further, with respect to claim 7, neither Bievenue et al. nor Byerly et al. describe, show or suggest an applicator with a distal end of the cap having a conical outer surface conforming with a taper on the distal end of the nozzle. Further, Applicants submit that claim 22 is dependent on allowable claim 14. Therefore, Applicants submit that claims 1-7 and 22 are patentable and not obvious under 35 U.S.C. §103(a) over Bievenue et al. in view of Byerly et al.

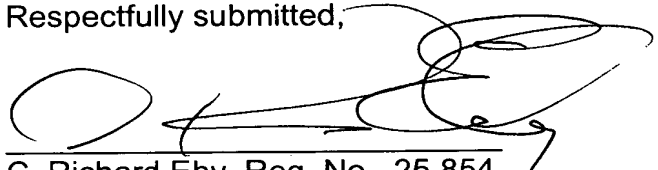
Claims 24 and 25 are rejected under 35 U.S.C. §103(a) as being unpatentable over Bievenue et al. in view of Smith et al., which relates to a fluid dispenser having a low energy coating on an orifice to improve fluid flow and reduce fluid clinging to the orifice. Claim 24 has been amended to be dependent on allowable claim 23; and

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therefore, Applicants submit that claims 24 and 25 are patentable and not obvious under 35 U.S.C. §103(a) over Bievenue et al. in view of Smith et al.

Applicants submit that the application is now in condition for allowance and reconsideration of the application is respectfully requested. The Examiner is invited to contact the undersigned in order to resolve any outstanding issues and expedite the allowance of this application.

Respectfully submitted,



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Amendments to the Drawings:

The attached sheet of drawings includes changes to Fig. 2A. This sheet, which includes Figs. 2A, 2B and 11, replaces the original sheet including Figs. 2A, 2B and 11. In Fig. 2A, previously omitted elements 113 and 118 has been added.

Attachment: 1 Replacement Sheet
 1 Annotated Sheet showing Changes

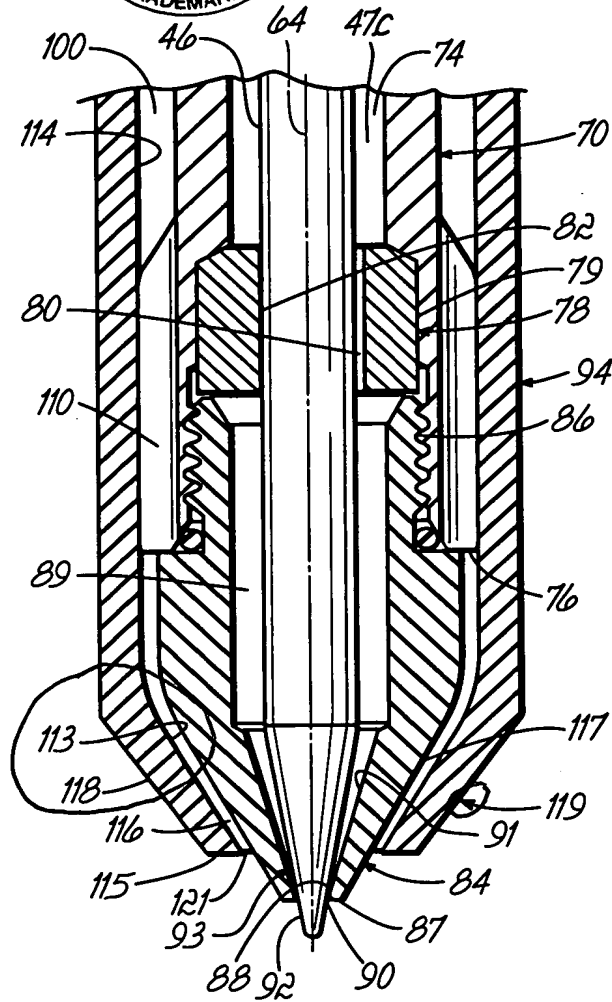


FIG. 2A

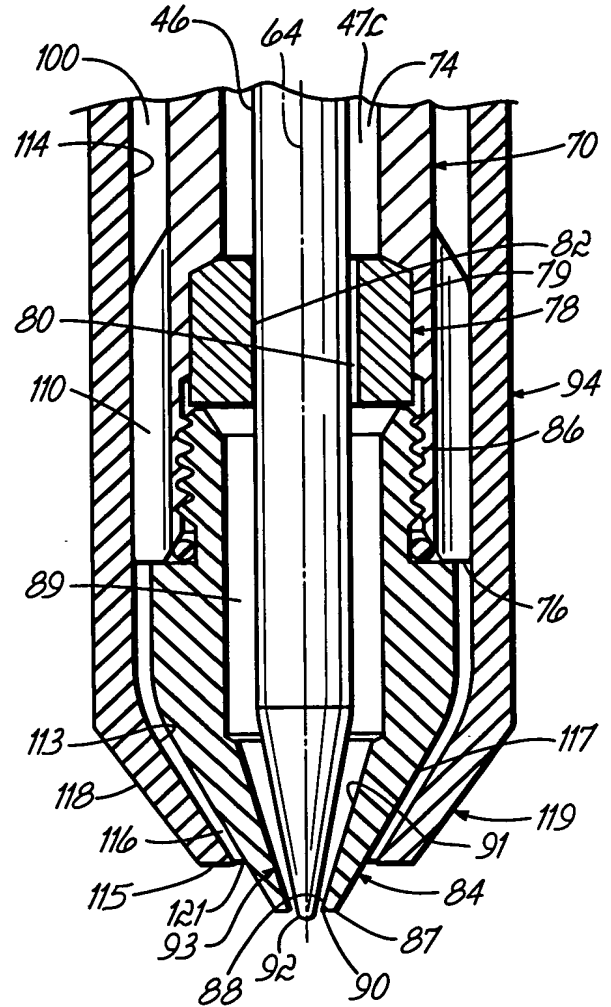


FIG. 2B

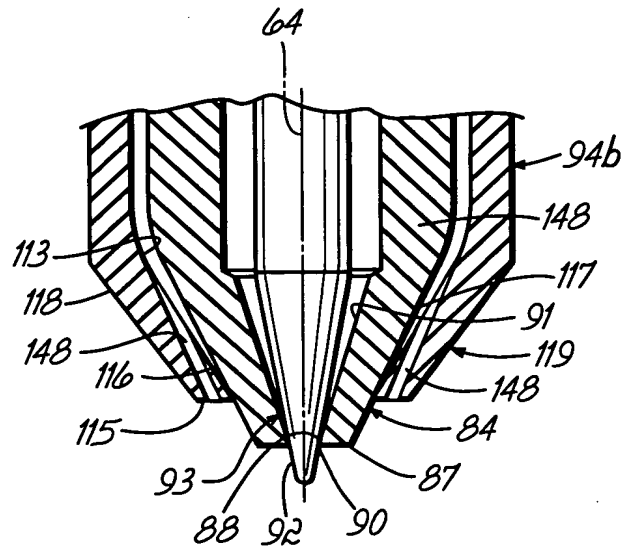


FIG. 11